

Supplemental 1

Spearman's correlations of Xeno-ER, -AR and AhR activity to semen concentration, motility and morphology overall and in the stratified into groups with higher and lower activity compared to the reference values in assays without and with the ligand added indicated as activity and competitive activity.

	Semen concentration								Motility								Morphology							
	Warsaw,		Greenland		Kharkiv,		Swedish		Warsaw,		Greenland		Kharkiv,		Swedish		Warsaw,		Greenland		Kharkiv,		Swedish	
	Poland		Ukraine		fishermen		Poland		Ukraine		fishermen		Poland		Ukraine		fishermen		Poland		Ukraine		fishermen	
XER activity	n	r	n	r	n	r	n	r	n	r	n	r	n	r	n	r	n	r	n	r	n	r	n	r
	81	0.06	51	-0.08	86	-0.10	96	0.01	82	0.01	51	-0.06	86	-0.07	95	0.07	82	0.05	50	0.06	84	0.05	92	0.06
XER activity < 3.14	49	0.29 ^a	41	0.04	41	-0.04	61	-0.16	49	0.30 ^a	41	0.06	41	-0.03	60	-0.11	49	-0.02	40	-0.01	39	-0.14	58	-0.09
XER activity ≥ 3.14	32	0.05	10	0.27	45	-0.24	35	0.42 ^a	33	-0.20	10	-0.43	45	0.06	35	0.31	33	0.00	10	0.07	45	-0.06	34	-0.00
XER competitive activity	79	-0.03	51	-0.05	86	-0.09	90	-0.13	80	-0.01	51	-0.02	86	-0.21 ^a	89	0.09	80	0.02	50	0.05	84	-0.25 ^a	86	-0.04
XERcomp. activity < 3.14	51	-0.12	47	-0.06	61	0.01	65	-0.16	52	-0.04	47	-0.04	61	-0.31 ^a	64	-0.08	52	-0.13	46	0.06	60	-0.27 ^a	62	-0.08
XERcomp. activity ≥ 3.14	28	-0.14	4	0.40	25	0.02	25	-0.17	28	-0.21	4	-0.80	25	-0.09	25	-0.02	28	0.23	4	-0.31	24	-0.02	24	0.02
XER-EEQ pg/g lipid ^b	19	0.20	1	-	12	-0.15	9	-0.15	19	0.29	1	-	12	0.72 ^a	9	-0.38	19	-0.03	1	-	12	0.53	9	0.37
XAR activity	69	-0.20	27	0.28	80	0.06	58	0.06	70	-0.01	27	0.23	80	-0.06	58	0.01	70	-0.11	27	0.10	78	0.08	57	-0.04
XAR activity < 3.14	24	0.03	4	0.20	24	0.24	14	0.23	24	-0.09	4	1.0 ^a	24	0.29	14	0.20	24	0.07	4	0.80	24	0.06	13	0.31
XAR activity ≥ 3.14	45	-0.11	23	0.17	56	0.11	44	-0.07	46	0.16	23	0.37	56	-0.19	44	0.13	46	-0.02	23	0.31	54	-0.01	44	-0.16
XAR competitive activity	69	-0.26 ^a	27	0.35	80	-0.08	58	0.06	70	0.10	27	0.23	80	-0.10	58	0.04	70	0.10	27	0.14	78	-0.09	57	0.02
XARcomp. activity < 3.14	39	-0.08	0	-	74	-0.09	40	0.03	40	0.10	0	-	74	-0.15	40	0.00	40	0.23	0	-	72	-0.21	39	-0.14
XARcomp. activity ≥ 3.14	30	0.03	26	0.29	6	0.42	18	-0.08	30	0.26	27	0.23	6	0.66	18	0.14	30	0.03	27	0.14	6	-0.42	18	0.14
AhR activity	81	0.29 ^a	54	0.14	84	0.08	76	-0.10	82	0.08	54	0.09	84	-0.01	70	0.02	82	0.16	53	0.11	82	0.03	74	-0.04
AhR activity < 6.67	0	-	1	-	0	-	0	-	0	-	1	-	0	-	0	-	0	-	1	-	0	-	0	-
AhR activity ≥ 6.67	81	0.29 ^a	53	0.10	84	0.08	76	-0.10	82	0.08	53	0.05	84	-0.01	70	0.02	82	0.16	52	0.11	82	0.03	74	-0.04
AhR competitive activity	81	0.04	54	-0.10	84	0.01	76	0.05	82	-0.02	54	0.04	84	-0.15	76	-0.03	82	-0.02	53	-0.08	82	-0.02	74	-0.05
AHRCOMP activity < 6.67	45	-0.05	7	0.75	42	-0.03	48	0.05	46	0.12	7	-0.36	42	0.03	48	-0.08	46	-0.25	7	-0.45	42	0.06	47	-0.08
AHRCOMP activity ≥ 6.67	36	0.26	47	-0.10	42	-0.32 ^a	28	0.23	36	0.12	47	0.08	42	-0.21	28	0.25	36	-0.01	46	-0.12	40	-0.09	27	0.16
AhR-TEQ pg/g lipid ^c	81	0.35 ^a	47	0.05	84	0.06	71	-0.07	82	0.15	47	-0.04	84	0.09	71	-0.09	82	0.24	46	0.18	82	0.13	69	-0.02

^a Correlation coefficients marked in bold indicates significant ($p<0.05$) correlations between the measured xenobiotic activity and endpoints.

^b XER-EEQ (17 β -estradiol equivalence) is calculated for samples with ER receptor agonist activity. (Bonefeld-Jorgensen et al. 2006).

^c AhR-TEQ (TCDD equivalence) is calculated for samples with AHR receptor agonist activity (Long et al. 2006).